

Notice No.1

Rules and Regulations for the Classification of Naval Ships, January 2019

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Please note that corrigenda amends to paragraphs, Tables and Figures are not shown in their entirety.

Issue date: June 2019

Amendments to	Effective date	IACS/IMO implementation (if applicable)
Volume 1, Part 1, Chapter 2, Sections 2, 3 & 4	1 July 2019	N/A
Volume 1, Part 1, Chapter 3, Sections 1, 2, 5, 7, 10 & 16	1 July 2019	N/A
Volume 1, Part 1, Chapter 3, Section 10, sub- Section 10.1	1 July 2019	1 July 2019
Volume 1, Part 3, Chapter 3, Section 2	1 July 2019	1 July 2019
Volume 1, Part 6, Chapter 4, Section 1	1 July 2019	N/A
Volume 1, Part 6, Chapter 6, Section 2	1 July 2019	N/A

Volume 1, Part 1,

Chapter 2

Classification Regulations

■ Section 2

Scope of the Rules

2.2 Definitions

2.2.5 **Laid-up notation.** A ship not under repair or not actively employed may be assigned the **laid-up** notation in order to maintain the ship in class subject to agreement by the Classification Committee. A general examination of the hull and machinery is to be carried out in lieu of the Annual Survey. An Underwater Examination (UWE) is to be carried out in lieu of the Special Survey. See;

- Vol 1, Pt 1, Ch 2, 4.10 Survey of ships out of commission and/or laid-up 4.10.1,
- Vol 1, Pt 1, Ch 3, 1.1 Frequency of surveys 1.1.4,
- Vol 1, Pt 1, Ch 3, 2.1 General 2.1.4,
- Vol 1, Pt 1, Ch 3, 5.1 General 5.1.4 and
- Vol 1, Pt 1, Ch 3, 7.1 Annual, Intermediate and Docking Survey 7.1.2.

The schedule of survey activities for a ship which is laid-up with personnel onboard and/or with some degree of ongoing system operation during the laid-up period will be specially considered.

Existing paragraphs 2.2.5 to 2.2.19 have been renumbered 2.2.6 to 2.2.20.

■ Section 3

Character of Classification and Class notations

3.10 Other notations

3.10.18 **ENV.** This notation will be assigned where the environmental protection arrangements demonstrate compliance with one or more characters as described in the Rules. Available characters include:

A	Anti-fouling coatings;
ABN	Airborne Noise;
GW	Grey water and sewage;
IHM	Inventory of Hazardous Materials;
MRV	Monitoring, reporting and verification of carbon dioxide;
NOx-2, NOx-3	Emissions of nitrogen oxides;
OW	Oily water management;
P	Oil tanks in protected locations;
RS	Refrigeration systems;
SOx	Emissions of sulphur oxides;
UWN	Underwater noise.

■ Section 4

Surveys – General

4.2 Survey

4.2.7 When a ship, upon completion, is not immediately commissioned but is laid-up for a period, LR, upon application by the Owner, prior to the ship proceeding to sea, will direct an examination to be made by the Surveyors which may include a survey in dry dock. If, as the result of such survey, the hull and machinery are reported in all respects in accordance with applicable Rule requirements, the subsequent Special Survey and Complete Survey of the machinery will date from the time of such examination.

4.10 Survey of ships out of commission and/or laid-up

~~4.10.1 The Classification requirements for laid-up vessels will be specially considered. Surveys for continuation of Class may be required at the request of the Owners and the discretion of LR.~~

4.10.1 For ships assigned the notation '**laid-up**', in order to maintain the ship in class, a general examination of the hull and machinery is to be carried out in lieu of the Annual Survey and an Underwater Examination (UWE) is to be carried out in lieu of the Special Survey, see;

- Vol 1, Pt 1, Ch 3, 2.1 General 2.1.4,
- Vol 1, Pt 1, Ch 3, 5.1 General 5.1.4 and
- Vol 1, Pt 1, Ch 3, 7.1 Annual, Intermediate and Docking Survey 7.1.2.

4.10.2 In cases where the ship has been laid up or has been out of service for a considerable period because of a major repair or modification, the next due Special Survey shall be carried out and the period of class will start from the survey completion date. Where the ship has been laid up for a shorter period and with consideration of the extent of system operation during the laid-up period, a reduced periodical scope will be specially considered at the request of the Owners and at the discretion of LR.

4.12 Ownership details

4.12.1 The Owner will ensure a member of the LR Group - Marine and Offshore division is promptly informed in writing of any change to their contact details and, in the event of a vessel/asset transfer or sale, is to supply details of the new Owner in writing. The new Owner is to promptly inform a member of the LR Group - Marine and Offshore division in writing of their contact details. If the new Owner fails to do so and if LR cannot verify the ownership record, then the class of that vessel/asset will be specially considered by the Classification Committee.

Volume 1, Part 1, Chapter 3 Periodical Survey Regulations

■ Section 1 General

1.1 Frequency of surveys

1.1.4 For ships assigned the notation '**laid-up**', in order to maintain the ship in class, a general examination of the hull and machinery is to be carried out in lieu of the Annual Survey and an Underwater Examination (UWE) is to be carried out in lieu of the Special Survey, see;

Vol 1, Pt 1, Ch 3, 2.1 General 2.1.4,

Vol 1, Pt 1, Ch 3, 5.1 General 5.1.4 and

Vol 1, Pt 1, Ch 3, 7.1 Annual, Intermediate and Docking Survey 7.1.2.

■ Section 2 Annual Surveys – Hull, machinery and optional requirements

2.1 General

2.1.4 For ships assigned the notation '**laid-up**', in lieu of the normal Annual Survey requirements a general examination of the hull and machinery is to be carried out.

2.4 Other notations

2.4.8 **Crew and Embarked Personnel Accommodation Comfort (CEPAC1 or CEPAC2).** The arrangements for managing observations/complaints for excessive noise and vibration are to be reviewed annually and any areas of concern identified for further monitoring. At each Renewal Survey measurements of noise and vibration are to be repeated at a minimum of 10 per cent of the original measurement locations and continued compliance confirmed. *See Vol 3, Pt 2, Ch 7, 7 Survey requirements.*

■ Section 5 Special Survey – Hull requirements

5.1 General

5.1.4 For ships assigned the notation '**laid-up**', an Underwater Examination (UWE) and general examination of hull and machinery are to be carried out in lieu of the normal Special Survey requirements.

■ Section 7 Machinery survey – General requirements

7.1 Annual, Intermediate and Docking Survey

7.1.2 For ships assigned the notation '**laid-up**', a general examination of the machinery is to be carried out in lieu of the normal Annual Survey requirements.

■ Section 10 Electrical equipment

10.1 Annual and Intermediate Survey

10.1.2 Where harmonic filters are fitted, the harmonic distortion level is to be measured annually and after any modification to the electrical distribution system or associated consumers. As a minimum, harmonic distortion measurements are to be taken at the main busbar(s) under seagoing conditions, as close to the annual survey as possible, and readings are to be recorded when the greatest amount of distortion is indicated, by suitably qualified and trained personnel.

Records are to include which equipment was running, including the load on it and the filters that were in service. These records are to be made available to the attending Surveyor on request.

Existing paragraph 10.1.2 has been renumbered 10.1.3.

10.2 Complete Surveys

10.2.12 Where the ship has high voltage electrical equipment and associated cables used for Ship Type and Mobility systems, the Surveyor is to visually examine the condition of their insulation systems for signs of deterioration, including partial discharge activity. Where deemed necessary by the Surveyor, boroscopic and/or endoscopic inspections are to be conducted. Areas to be considered for examination are to include, but are not limited to:

- winding ends of all high voltage electrical machines;
- electrical motor core laminations; stator wedges; stator bars; space blocks; and connection rings;
- terminal connections of high voltage equipment; and
- high voltage cable connections.

10.2.13 Where on-line partial discharge monitoring equipment has been fitted to high voltage equipment used for the provision of ship type or mobility systems, the Surveyor is to review the test reports for signs of deteriorating performance of the insulation system, see Vol 2, Pt 9, Ch 12, 1.4 On-line partial discharge testing of high voltage rotating machines for ship type and mobility systems.

Existing paragraph 10.2.12 has been renumbered 10.2.14.

■ Section 16 Classification of ships not built under LR survey

16.1 General

16.1.1 When classification is desired for a ship not built under the supervision of LR Surveyors, application should be made in writing. The scope of classification will include hull and machinery aspects, as defined in Vol 1, Pt 1, Ch 3, 16.2 Hull and equipment and Vol 1, Pt 1, Ch 3, 16.3 Machinery, in addition to any additional notations requested, but may be limited to hull-only aspects on request.

16.1.2 Periodical Surveys of such ships not built under survey, when classed, are subsequently to be held as in the case of ships built under survey.

Volume 1, Part 3, Chapter 3 Ship Control Systems

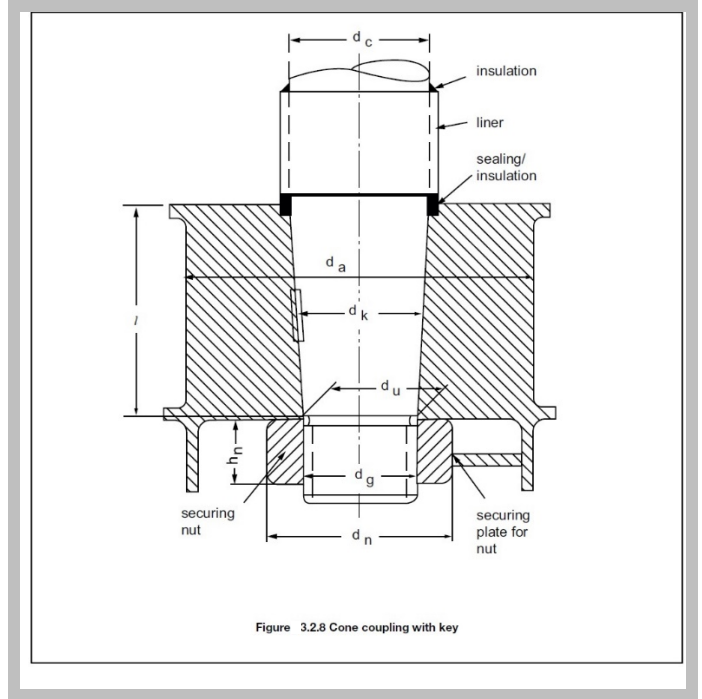
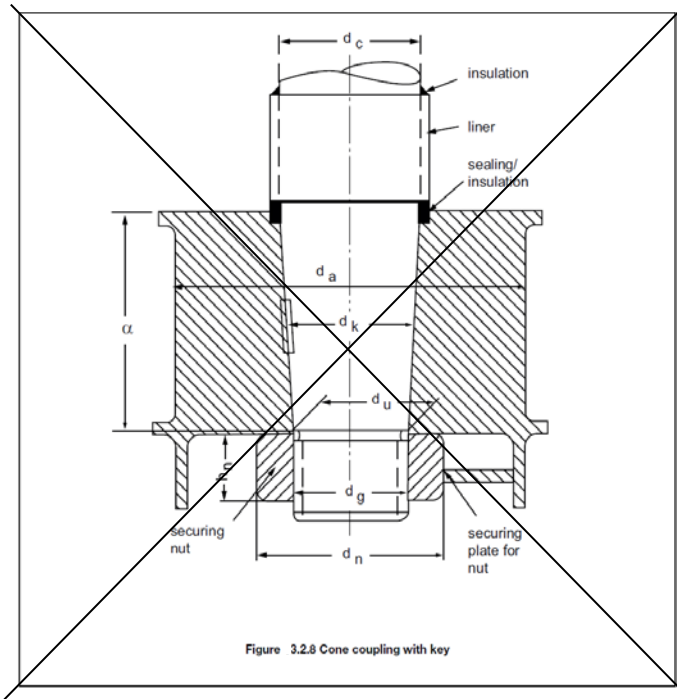
■ Section 2 Rudders

2.12 Connections of rudder blade structure with solid parts

2.12.1 Solid parts in forged or cast steel, which house the rudder stock or pintle, are normally to be provided with protrusions, except as follows, see Figure 13.2.4 Cross-section of the connection between rudder blade structure and rudder stock housing. These protrusions are not required when the web plate thickness is less than:

- (a) 10 mm for web plates welded to the solid part on which the lower pintle of semi-spade rudder is housed and for vertical web plates welded to the solid part of the rudder stock coupling of spade rudders.
- (b) 20 mm for other web plates.

2.14 Cone couplings with key



2.15 Cone couplings with special arrangements for mounting and dismantling the couplings

2.15.4 The push up pressure, p_{req} , is not to be less than the greater of the two following values:

$$p_{req1} = \frac{2Q_F}{d_m^2 l \pi \mu_0} 10^3 \text{ N/mm}^2$$

$$p_{req2} = \frac{6M_b}{l^2 d_m} 10^3 \text{ N/mm}^2$$

where

Q_F = design yield moment of rudder stock, in Nm, as defined in Vol 1, Pt 3, Ch 3, 2.14 Cone couplings with key 2.14.3.

d_m = mean cone diameter in, mm $= \frac{(d_u + d_c)}{2}$.

l = cone length in, mm, see Figure 3.2.8 Cone coupling with key.

μ_0 = frictional coefficient, to be taken as 0,15.

M_b = bending moment in the cone coupling (e.g. in case of spade rudders), in Nm.

d_u = upper cone diameter, see Figure 3.2.8 Cone coupling with key.

d_c = lower cone diameter, see Figure 3.2.8 Cone coupling with key.

It has to be proved by the designer that the push-up pressure does not exceed the permissible surface pressure in the cone. The permissible surface pressure is to be determined by the following formula:

$$p_{perm} = \frac{0,9 \sigma_g (1 - \alpha^2)}{\sqrt{3 + \alpha^4}} \text{ N/mm}^2$$

$$p_{perm} = \frac{0,95 \sigma_g (1 - \alpha^2)}{\sqrt{3 + \alpha^4}} - p_b \text{ N/mm}^2$$

where

$$p_b = \frac{3,5 M_b}{d_m l^2} 10^3$$

σ_g = minimum specified yield stress of the material of the gudgeon in N/mm².

$$\alpha = \frac{d_m}{d_a}$$

d_a = outer diameter of the gudgeon to be not less than 1,5 d_m 1,25 d_c , in mm, see Figure 3.2.8 Cone coupling with key.

l = cone length in, mm, see Figure 3.2.8 Cone coupling with key.

M_b = bending moment in the cone coupling (e.g. in case of spade rudders), in Nm.

2.15.5 The push-up length Δl , is to comply with the following formula, but in no case is to be less than 2 mm:

$$\Delta l_1 \leq \Delta l \leq \Delta l_2$$

where

$$\Delta l_1 = \frac{p_{req}}{E \frac{1-\alpha^2}{2} \theta_t} + \frac{0,8 R_{tm}}{\theta_t} \text{ mm} \quad \Delta l_1 = \frac{p_{req} d_m}{E \left(\frac{1-\alpha^2}{2} \right) \theta_t} + \frac{0,8 R_{tm}}{\theta_t} \text{ mm}$$

$$\Delta l_2 = \frac{1,6 \sigma_y d_m}{E \theta_t \sqrt{3+\alpha^2}} + \frac{0,8 R_{tm}}{\theta_t} \text{ mm} \quad \Delta l_2 = \frac{p_{perm} d_m}{E \left(\frac{1-\alpha^2}{2} \right) \theta_t} + \frac{0,8 R_{tm}}{\theta_t} \text{ mm}$$

where

p_{req} , p_{perm} , α , d_m are defined in Vol 1, Pt 3, Ch 3, 2.15 Cone couplings with special arrangements for mounting and dismounting the couplings 2.15.4

R_{tm} = mean roughness in, mm, taken equal to 0,01

E = Young's modulus of the material, in N/mm²

θ_t = taper on diameter, see Vol 1, Pt 3, Ch 3, 2.15 Cone couplings with special arrangements for mounting and dismounting the couplings 2.15.4 Vol 1, Pt 3, Ch 3, 2.14 Cone couplings with key

2.16 Pintles

2.16.5 The required push-up pressure for pintle bearings is to be determined by the following formula:

$$p_{req} = 0,4 \frac{B_1 d_p}{d_m^2 l} \text{ N/mm}^2 \quad p_{req} = 0,4 \frac{B_1 d_p}{d_m^2 l} \text{ N/mm}^2$$

where

d_m and l are defined in Vol 1, Pt 3, Ch 3, 2.15 Cone couplings with special arrangements for mounting and dismounting the couplings 2.15.4

B_1 = supporting force in the pintle bearing, in N

d_p = actual pintle diameter, in mm.

The push-up length is to be calculated in accordance with Vol 1, Pt 3, Ch 3, 2.15 Cone couplings with special arrangements for mounting and dismounting the couplings 2.15.5, using the required push-up pressure and properties for the pintle bearing.

Volume 1, Part 6, Chapter 4 Hull Girder Strength

■ Section 1 General

1.3 Symbols and definitions

1.3.2 The strength deck is to be taken as follows:

- Where there is a complete upper deck, the strength deck is the upper deck.
- Where the upper deck is stepped, as in the case of ships with a raised quarterdeck, the strength deck is also stepped, see Vol 1, Pt 6, Ch 4, 1.4 Calculation of hull section modulus, as shown in Figure 4.1.1 Strength deck. Adequate provision should be made for the transfer of load between the stepped decks. The length of overlap is required to be taken as 4 times the deck height.

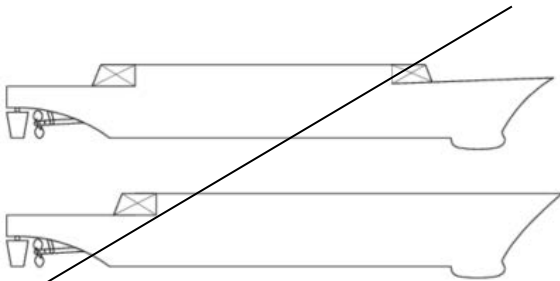


Figure 4.1.1 Strength deck

1.4 Calculation of hull section modulus

1.4.4 A transition zone, see *Figure 4.1.1 Strength deck stepping*, is to be assumed at the ends of stepped decks where the longitudinal structural material cannot be included in the calculation of the section modulus of hull sections. The length of the zone is to be taken as four times the deck height. Local insert plates are to be fitted in the side shell as appropriate with a thickness at least 25 per cent greater than the adjacent plating. They are to extend a minimum of one primary frame spacing forward and aft, but are to be not less than 1500 mm each way from the end of the transition zone. For vessels with complex arrangements or geometries, shadow area plans are to be submitted.

1.4.5 A superstructure deck can only be considered as a strength deck and included in the calculation of the section modulus of hull sections if it extends over the full $0,4L_R$ midship region and out to the side shell with the transition zones being located outside the $0,4L_R$ midship region, see *Figure 4.1.2 Strength deck stepping, superstructure deck*.

Existing paragraphs 1.4.4 to 1.4.16 have been renumbered 1.4.6 to 1.4.18.

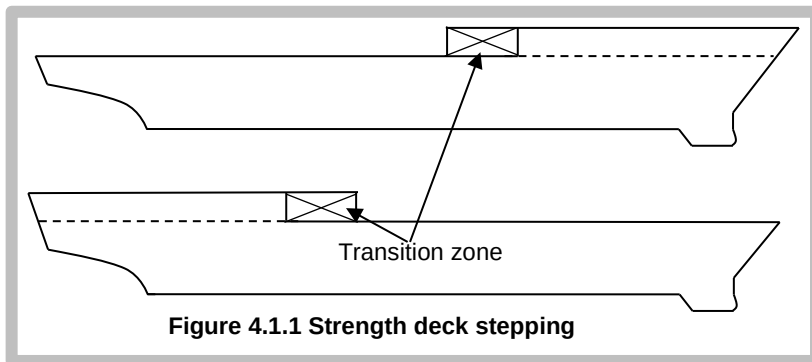


Figure 4.1.1 Strength deck stepping

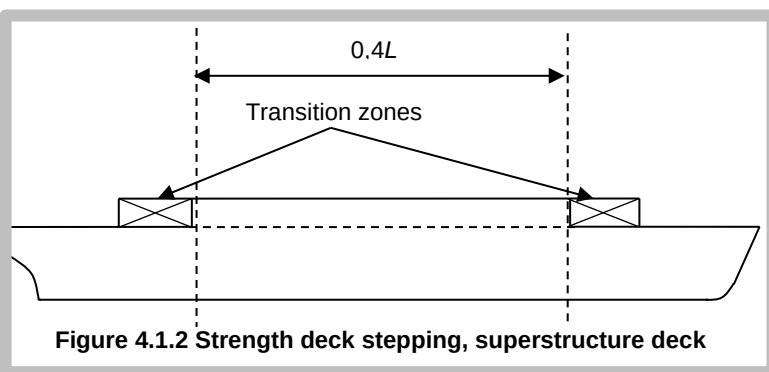


Figure 4.1.2 Strength deck stepping, superstructure deck

Existing Figure 4.1.2 has been renumbered as Figure 4.1.3.

Volume 1, Part 6,

Chapter 6

Material and Welding Requirements

■ Section 2

Materials

2.4 Ships operating in cold weather conditions

2.4.2 Unless otherwise specified, all ships designed for sea area **SA1** and other ships intended to operate for extended periods in cold weather conditions, the material class and minimum grade requirements dependent on thickness are to be in accordance with *Table 6.2.5 Material classes and grades for structures exposed to low temperatures* and *Table 6.2.6 Steel grades for cold weather*. The requirements are based on a lowest mean daily average design air temperature of -30°C . Where an alternative design air temperature is required, the choice of material grades will be specially considered, see also *The Provisional Rules for the Winterisation of Ships*, July 2019.

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